Structural geometry and kinematic evolution of the Latakia – Tartus Ridge system of the Cyprian Arc, East Mediterranean Sea

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The Cyprian Arc defines the active tectonic boundary between the African Plate to the south, the Arabian microplate to the east, and the Anatolian microplate to the north. This plate boundary has evolved from north-south contraction related to subduction of the African plate below the forearc region of the Anatolian Plate to strike slip in transpression related to the collision of the Arabian and Eurasian/Anatolian plates. The morphological expression of the front of the Cyprian arc is a narrow east-west trending ridge situated southeast of Cyprus and known as the Latakia Ridge, and the broad system of northeast-southwest trending ridges situated to the west of the coast of the Arabian Plate.

The structural geometry and evolution of the plate boundary has been under discussion since publications starting in the early 1990's based on regional marine seismic surveys. Previous work by the East Mediterranean Research Group at MUN (2005) in the region of the Cyprus Arc has presented new interpretations based on analysis of a somewhat limited set of high-resolution seismic profiles. These interpretations lacked a solid underpinning of the assumed lateral continuity of the structures along strike based on the morphotectonic expression of the ridge system. Recently, a high-resolution side-scan sonar

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map of the seabed morphology in this deep-water region has become available for detailed analysis. This new morphotectonic map clearly shows that the ridges are segmented across lineaments striking NE – SW, and that the structural elements underlying the ridges are discontinuous and offset in apparent strike separation.

This Honours thesis study proposes to execute a detailed morphological and structural analysis of the seabed map to identify the plan view pattern of the active faults that control the architecture of the ridge system. Following this analytical phase, the stratigraphy and structure of the ridge segments will be analyzed in a set of high-resolution marine seismic profiles collected by the MUN research group. This part of the study will also utilize available seismic profiles collected by other consortia. It is expected that the proposed study will yield a more refined and accurate interpretation of the geometry and kinematic evolution of this complicated plate boundary region.